REFLECTIONS ON HOW DESIGNER FIGURATION DESIGN DATA

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* university of utah † microsoft research

images: visual.ly



INFOGRAPHICS













The HBO Recycling Program

Actors who have appeared in three or more episodes of multiple scripted, live-action, original HBO series since Oz (excluding miniseries)

image: grantland.com/features/
the-hbo-recycling-program/

Aidan Gillen Amy Ryan Annie Fitzgerald Anwan Glover Blair Underwood Brian F. O'Byrne Chris Bauer Clarke Peters Cynthia Ettinger Cyrus Farmer Dane DeHaan Dania Ramirez David Costabile Dayton Callie Domenick Lombardozzi Don Swayze Edie Falco Edoardo Ballerini Edwina Findley Garret Dillahunt Glynn Turman Grant Show Greg Antonacci J. Smith-Cameron James Ransone Jamie-Lynn Sigler Jim Beaver Jim True-Frost John Carroll Lynch John Doman John Hawkes John Seda Kevin Rankin Kim Dickens Laila Robins Lance Reddick Louis Lombardi Luis Guzmán Luke Perry Mary Kay Place Matt Winston Max Casella Method Man Michael Kenneth Williams Michelle Forbes Paul Ben-Victor Paul Herman Paula Malcomson Reg E. Cathey Robert Clohessy Roxanne Hart Seth Gilliam Stephen Toblowsky Steve Buscemi Steve Earle Ted Danson Tom Aldredge Tom Mardirosian Tom Townsend Toni Lewis Vincent Piazza Wendell Pierce William Sanderson Willie Garson Zeljko Ivanek J.D. Williams*





* Apologies that J.D. Williams is out of alphabetical order. Research: Sam Schube and Danny Savitzky Visualization: Craig Robinson

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81% SOCIAL

81% of the face-to-face encounters happen with friends for extented periods of time. Noone really likes business meetings.

98% OF E-MAILS

Were business related. A vast majority of these were sent in the evening, and were less than 120 words.

85% OF CHATS

are personal. This is probably based around the entire "etiquette" of the workplace and freelancing.

52% OF CALLS

Telephone calls are nearly evenly divided between social and business calls. Part of this can be blamed on the frequency of conference calls that I have.

image: portfolio.rachelmercer.org/projects/2634975#1



85% OF TEXTS

More than 85% of text messages sent were to friends or family. These increase drastically on Fridays, probably because of the alcohol.

THE PROCESS OF CREATING VISUALIZATIONS

image: wikipedia.org

OBSERVATIONS PATTERNS OPPORTUNITIES

OBSERVATIONS PATTERNS OPPORTUNITIES



			Programming	Data
Code	Gender	Design Role	Experience	Experience
One 2-hour	Exercise (Time Travel)		
T1	М	Student	None	None
T2	F	Student	None	None
Two 2-hour	Exercises	(Time Travel)		
Т3	F	Industry-software	None	Basic
T4*	F	Industry-software	None	Basic
One 2-hour	Exercise (HBO)		
H1*	М	Industry-freelance	Basic	Basic
H2	F	Industry-software	Basic	Basic
10 hours ob	servation	at hackathon (FitBit)*		
F1	F	Industry-software	None	Basic
F2	F	Industry-software	Basic	Expert
3 hours obs	ervation a	at hackathon (Bug Tracking)		
B1	F	Industry-software	None	None
Unstructure	d Intervie	2WS*		
11	М	Academic	None	Basic
12	М	Industry-design firm	Expert	Expert
Semistructu	ired Interv	views		
13	М	Academic	Expert	Expert
14	М	Industry-freelance	Basic	Basic
15	F	Academic	Basic	Expert
16	М	Industry-laboratory	Basic	Expert

our designers



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our designers: - strong design skills

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our designers: - strong design skills - diverse programming, data experience

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our designers:

our methods: - unstructured, semistructured interviews

strong design skills diverse programming, data experience

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our designers: data experience

our methods: - unstructured, semistructured interviews - exercises in the lab

strong design skills diverse programming,

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our designers: data experience

our methods: - unstructured, semistructured interviews

- strong design skills - diverse programming,

- exercises in the lab - observations in the wild

OBSERVATIONS PATTERNS OPPORTUNITIES

MANUAL ENCODING



MANUAL ENCODING



"I am amazed at what people will sit through in terms of doing something manually... not all of it is unenjoyable....

There's something great about just sitting there [with] my music on... [and getting] it perfect."

1. Designers did not necessarily dislike manual encoding

PATTERNS

MANUAL ENCODING





1. Designers did not necessarily dislike manual encoding

2. The cost of manual encoding prevented variation





"I sketched that I was going to do [one thing]... but once I got it on the page, I saw something else....

If I twist this, then the whole grid is going to change, and I'm going to have to... manually reset [everything]."





"You gain insight by working directly with the data. The best designers are the ones that will open up Excel and manipulate the data before they get to the graphics part."



1. Designers did not necessarily dislike manual encoding

3. Manual encoding was a form of data exploration



- 1. Designers did not necessarily dislike manual encoding
- 3. Manual encoding was a form of data exploration
- 4. Data exploration & manipulation related to experience









Movie	Release	Start	Stop
Timeline	2003	2003	1357
Terminator 3: Rise of the Machines	2002	2004	2033
The Butterfly Effect	2004	2004	1980
The Jacket	2005	1992	2007
Timecop	1994	1929	1994
Meet the Robinsons	2007	2007	2037
Star Trek	2009	2387	2233
Time After Time	1979	1893	1979
The Final Countdown	1980	1980	1941
Somewhere in Time	1980	1972	1912
The Terminator	1984	2029	1984
The Philadelphia Experiment	1984	1943	1984
Back to the Future	1985	1985	1955
Star Trek IV: The Voyage Home	1986	2286	1986
Flight of the Navigator	1986	1978	1986
Back to the Future Part III	1990	1985	1855
Terminator 2: Judgement Day	1991	2030	1984
Bill and Ted's Bogus Journey	1991	2691	1991
Army of Darkness	1992	1992	1300
A Sound of Thunder	2005	2055	-150M
Freejack	1992	1991	2009
Teenage Mutant Ninja Turtles III	1993	1993	1603
Timecop	1994	2004	1929
Star Trek: First Contact	1996	2373	2063
Frequency	2000	1999	1969
Black Knight	2001	2001	1328
Kate and Leopold	2001	1876	2000
Extra data point: Looper	2012	2074	2044



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5. Inferences about behavior were often inaccurate

PATTERNS

5. Inferences about behavior were often inaccurate

6. Encodings remained unchanged until assumptions were shown to be incorrect



HOW DATA AFFECTED DESIGN











HOW DATA AFFECTED DESIGN

5. Inferences about behavior were often inaccurate

were shown to be incorrect

7. Inferences about structure were often separated from actual data



The HBO Recycling Program

Actors who have appeared in three or more episodes of multiple scripted, live-action, original HBO series since Oz (excluding miniseries)

Aidan Gillen Amy Ryan Annie Fitzgerald Anwan Glover Blair Underwood Brian F. O'Byrne Chris Bauer Clarke Peters Cynthia Ettinger Cyrus Farmer Dane DeHaan Dania Ramirez David Costabile Dayton Callie Domenick Lombardozzi Don Swayze Edie Falco Edoardo Ballerini Edwina Findley Garret Dillahunt Glynn Turman Grant Show Greg Antonacci J. Smith-Cameron James Ransone Jamie-Lynn Sigler Jim Beaver Jim True-Frost John Carroll Lynch John Doman John Hawkes John Seda Kevin Rankin Kim Dickens Laila Robins Lance Reddick Louis Lombardi Luis Guzmán Luke Perry Mary Kay Place Matt Winston Max Casella Method Man Michael Kenneth Williams Michelle Forbes Paul Ben-Victor Paul Herman Paula Malcomson

image: grantland.com/features/ the-hbo-recycling-program/ DESIGN $\left| + \right\rangle$



Person	Appearances	Big Love	soardwalk Empire	Bored to Death	Carnivale) Your Enthusiasm	Deadwood	Aidan Gillen Amy Ryan Annie Fitzgerald Anwan Glover
Alan Taylor	6			director,producer			director	Blair Underwood Brian F. O'Byrne
Daniel Attias	6	director,producer						Chris Bauer Clarke Peters
Timothy Van Patten	5		director,producer					Cynthia Ettinger Cyrus Farmer
Peter Phillips	4	producer						Dane DeHaan Dania Ramirez
Julian Farino	4	director						David Costabile
Stephen Levinson	4		producer					Domenick Lombardozzi
Mark Wahlberg	4		, producer					Edie Falco
David Mills	3							Edoardo Ballerini Edwina Findley
Gregg Fienberg	3				producer		director.producer	Garret Dillahunt Glynn Turman
Meg Reticker	3	editor		editor			, так д	Grant Show Greg Antonacci
Laila Robins	3			cast				J. Smith-Cameron James Ransone
Lance Reddick	3							Jamie-Lynn Sigler Jim Beaver
Nina Kostroff-Noble	3							Jim True-Frost John Carroll Lynch
Jeremy Podeswa	3		director		director			John Doman
Reg F Cathey	3 3		unceton		uncetor			John Seda
David Petrarca	3 2	director						Kim Dickens
Bobby Cannavale	3	director	cast					Laita Robins Lance Reddick
Mickio Poustor	2		cast					Louis Lombardi Luis Guzmán
Allon Coultor	ა ა		director					Luke Perry Mary Kay Place
Michael Duccie	ວ າ		unector					Matt Winston Max Casella
	3 ว		dinaatan					Method Man Michael Kenneth Williams
Didu Anuerson	ა ე		unector					Michelle Forbes Paul Ben Victor
Bernadette Caulfield	3	producer			producer			Paul Herman
Steve lurner	კ	producer	producer				producer	Ren F. Cathey

image: grantland.com/features/ the-hbo-recycling-program/ ECTED DESIGN

The HBO Recycling Program Actors who have appeared in three or more episodes of multiple scripted,

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image: grantland.com/features/ the-hbo-recycling-program/ ECTED DESIGN

5. Inferences about behavior were often inaccurate

were shown to be incorrect

7. Inferences about structure were often separated from actual data

8. Designers did not vary from given data structure



9. High-level elements, followed by sketching in data points

PATTERNS

10. Encoding was a later consideration



ORDER OF OPERATIONS

"You almost see masses and blobs and shapes, and the relationship between them."



() R D E R () EOPERATIONS

"The way that [programmers] approach it is from the detail, back out... [for us], the data binding stuff is really less important at first.... If you start with specifications, you've limited your design world immediately."



10. Encoding was a later consideration

11. Designers disliked tools that enforced a process



Processing

PATTERNS

10. Encoding was a later consideration

11. Designers disliked tools that enforced a process

12. Automation still resulted in manual labor





Illustrator

PATTERNS



"I created a plot in Tableau and

I did [a] donut chart in Excel because Tableau doesn't have them. I then changed the colors [in Illustrator]... to get rid of the Microsoft colors."

image: Sandro et al.: Tight Coordination of Protein Translation and HSF1 Activation Supports the Anabolic Malignant State

then exported to Illustrator... I had to manually pull [the labels] apart....

"... I went to Processing. I looked online [for] tutorials to help me put the data into [my] idea.... [From] my simple Processing code,... I created a .pdf, and brought it back into Illustrator.



I teach myself programming when I don't see any other way."

image: A. Chesnais: ACM is Built on Volunteers' Shoulders

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789 INDIVIDUALS WORKED 205,189 HOURS (OVER 23 YEARS TO MAKE THE SIGGRAPH 2010 CONFERENCE



OBSERVATIONS PATTERNS OPPORTUNITIES

MANUAL ENCODING HAS ITS BENEFITS

image: The Car Spy, flickr.com









[2, 8, 3, 2, 10]

[2, 8, 3, 2, 10]



RELAX THE SEQUENCE

Data Transformations Scales Axes Marks

RELAX THE SEQUENCE

Data * Transformations Scales

Axes Marks

CREATING AN EFFECTIVE DATA ABSTRACTION



Excel



DataWrangler^{alpha}

Data Wrangler

OBSERVATIONS PATTERNS OPPORTUNITIES

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